# 5. COMPARISON OF SUSTAINED AND WEEKLY BAITING IN FIELD RODENTS OF JAIPUR REGION

There is an increasing awareness all over the world of economic significance of vertebrate pests, especially rodents. Anticoagulant rodenticides have been evaluated in the Indian subcontinent and some of them were found to be effective, Mathur and Prakash (1980). The present study is conducted to evaluate the weekly and sustained baiting of two anticoagulants, warfarin (0.025% concentration) and bromadiolone (0.005% concentration) in field conditions.

## Materials and Methods

The field trial was conducted at village Muhana, 22 km away from Jaipur city. Treatment was carried out in ten different plots, approximately 2.2 hectares each. The pre-treatment level of rodent infestation was estimated by adopting the burrow count method, Barnett and Prakash (1975). The burrows were located, checked for occupancy and plugged with wet soil and lime in experimental plots. The reopened burrows on the next day were treated with 20 gm of poison bait. Sustained baiting with warfarin wax cakes of 0.025% concentration in four plots and weekly baiting with bromadiolone wax cakes of 0.005% concentration, being placed deep inside the burrows in rest of the four plots. Two untreated plots served as the control. Baiting started within fifteen days of planting until the crop was twelve week old. After treatment, burrows were closed and marked. The experimental plots were kept under strict vigil and visited thrice a week. The efficacy of rodenticides was evaluated on the basis of burrow reduction in each plot.

## Results and Discussion

Control obtained with bromadiolone (0.005 per cent wax cakes) was 90 per cent as compared to 83 per cent with warfarin (0.025% wax cakes) Tables 1 and 2. Marsh *et al.* (1980) in field trials against the three commensal rodents reported bromadiolone to be highly potent and with a high degree of palatability. Redfern and Gill (1980) reported cent per cent mortality with bromadiolone after three days of feeding against rats and mice.

Table 1
SUSTAINED BAITING WITH WARFARIN (0.025% WAX CAKES)

| Plot | Pre-treatment live burrow count | Reduction in live burrows | Reduction in in live burrows (%) | Success over control (%) |
|---|---|---|---|---|
| A | 164 | 24 | 85.36 | 83.48 |
| B | 175 | 23 | 86.85 | 84.97 |
| C | 182 | 26 | 85.71 | 83.83 |
| D | 194 | 28 | 85.56 | 83.68 |
| Control | 170 | 167 | 1.88 | — |

Table 2
WEEKLY BAITING WITH BROMADIOLONE (0.005% WAX CAKES)

| Plot | Pre-treatment live burrow count | Reduction in live burrows | Reduction in in live burrows (%) | Success over control (%) |
|---|---|---|---|---|
| A | 154 | 13 | 91.55 | 89.05 |
| B | 140 | 10 | 92.85 | 90.35 |
| C | 145 | 11 | 92.41 | 89.91 |
| D | 138 | 09 | 93.47 | 90.97 |
| Control | 160 | 156 | 2.5 | — |

Warfarin requires considerably longer feeding period to be effective. Similar results have been obtained for *T. indica* and *M. hurrianae* which were less susceptible to warfarin than *R. norvegicus*, Bentley and Larthe (1959), *B. bengalensis*, Brooks *et al.* (1980).

From the results it can be concluded that sustained baiting requires excess amount of bait which is not economical and involves much labour, whereas weekly baiting is more effective as it gives maximum control success with less quantity of poison bait. The studies further indicate that weekly baiting reduces cost and reduces possible risks to non-target species which is an important factor. The observations also show that when both the poison

warfarin and bromadiolone are used in the field, as wax cake formulations, bromadiolone was more effective compared to warfarin.

October 27, 1995

RAJNI CHAWLA
*Department of Zoology,*
*University of Rajasthan, Jaipur (India)*

## References

Barnett, S.A. & I. Prakash (1975): Rodents of Economic Importance in India. pp. 1-175. Arnold Heinemann, New Delhi and London.

Bentley, E.W. & Y. Larthe (1959): The comparative rodenticidal efficacy of five anticoagulants. *J. Hyg. Camp. 57*: 135-49.

Brooks, J.E., P.T. Htun & H. Naing (1980): The susceptibility of *Bandicota bengalensis* from Rangoon, Burma to several anticoagulant rodenticides. *J. Hyg. Camp. 84*: 127-135.

Mathur, R.P. & I. Prakash (1980): Laboratory evaluation of anticoagulant treated baits for the control of the Northern palm squirrel, *Funambulus pennanti* Wroughton. *J. Hyg. Camb. 85*: 421-426.

Marsh, R.E., W.E. Howard & W.B. Jackson (1980): Bromadiolone: A new toxicant for rodent control. *Pest control 48(8)*: 22, 24 & 26.

Redfern, R. & J.E. Gill (1980): Laboratory evaluation of Bromadiolone as a rodenticide for use against warfarin resistant and nonresistant rat and mice. *J. Hyg. Camb. 84*: 263-268.

# 6. LABORATORY EVALUATION OF CHOLECALCIFEROL AGAINST *MUS MUSCULUS* (BLYTH)

## Introduction

Rodents are one of the major vertebrate pests causing considerable damage to crops, stores, godowns and other articles of human value. At present there is a diverse selection of excellent rodenticides available for rodent control. Cholecalciferol is both a single and multiple feeding toxicant effective on *Mus musculus, Rattus rattus* and *Rattus norvegicus* (Marshall 1984). Cholecalciferol (vit. $D_3$) is closely related with calciferol (vit. $D_2$). The efficacy of calciferol against warfarin resistant and non-resistant rats and mice were reported by Renninson (1974), Rowe *et al.* (1974) and Muktha Bai *et al.* (1978). In the present investigation the toxicity and palatability of cholecalciferol (vit. $D_3$) were evaluated against *Mus musculus* (Blyth) in choice feeding test.

## Material and Methods

Choice feeding test was carried out in the laboratory against *Mus nusculus* (Blyth). Prior to the experimentation, animals were acclimatized for 15 days. They were fed on mice feed (Brooke Bond Lipton India Ltd.) and water *ad libitum.* Thirty Six healthy individually caged animals were weighed and sexed (18 Males and 18 Females). After 24 hr of starvation they were exposed to poison and plain baits. The poison baits were prepared in broken bajra *(P. typhoides)* mixed with 3% til oil (*Sesamum indicum*). The plain baits contained broken bajra mixed with 3% til oil only. The period of exposure was 24 hr only. The left over and spilled food were weighed the next day. After exposure the animals were kept on mice feed and water *ad libitum.* The observations were made up to 15 days.

Table 1
TOXICITY OF CHOLECALCIFEROL (VIT. $D_3$) AGAINST *Mus musculus* (BLYTH) [CHOICE FEEDING TEST]

| Conc. of VIT. $D_3$ % | Exposure Period Hr | Weight of Mice (Blyth) Mean ± S.E. [g] | Bait consumption [g/kg.b.wt.] Mean ± S.E. | | Active Ingredient mg/kg.b.wt. Mean ± S.E. | % mortality | Days to Death | |
|---|---|---|---|---|---|---|---|---|
| | | | Plain Bait | Poison Bait | | | Mean | Range |
| 0.075 | 24 | 31.4±4.2 | 103.5±4.1 | 91.29±6.0 | 68.4±2.28 | 100 | 4.15 | 2.9-5.4 |
| 0.05 | 24 | 33.0±3.9 | 101.7±4.3 | 94.22±4.3 | 47.0±2.4 | 100 | 4.59 | 3.0-6.19 |
| 0.025 | 24 | 30.6±4.4 | 100.35±6.0 | 97.14±6.6 | 24.03±2.4 | 50 | 11.00 | 7.0-15 |